*** Executive Summary ***
Staff Draft Definition of Appropriate Agricultural Water Use Measurement

Background

Existing measurement of agricultural water use is based on unique, place-specific histories, economics and needs. Many California stakeholder groups have recognized the importance of measurement to state and federal agencies trying to manage increasingly scarce water resources. Recognizing the importance of and intense stakeholder interest in measurement, the CALFED Bay-Delta Program's August 2000 Record of Decision called for CALFED Agencies to "work with the California State Legislature to develop legislation …requiring the appropriate measurement of all water uses in the State."

To this end, the California Bay-Delta Authority (Authority) has assembled a Technical Team[1] to undertake an extensive, rigorous and region-specific analysis intended to define "appropriate measurement" of agricultural water use in California. The Technical Team's measurement analysis has been informed by a panel of experts[2] and the continued input of diverse and informed stakeholders.

Preliminary Staff Conclusions

The Technical Team has developed a number of preliminary conclusions related to the appropriateness of measurement. These conclusions, detailed below, are derived from findings that suggest the current measurement approach does not now paint a complete and accurate enough picture of where water is going and how it is being used. Put simply, state and federal water agencies and the public need a better understanding of the destination of agricultural water (diversions, losses and deliveries) to appropriately allocate future investments in grants, loans and technical assistance, and to make critical decisions on major water management options, such as whether a basin is over-allocated at a certain time or whether and how much to invest in surface storage.

The intent of these conclusions is neither to chart nor preclude any particular implementation path. That task is to be handled in subsequent stakeholder discussions and will be underpinned by the Authority's commitment to regionally sensitive, incentive-driven and cost-effective approaches. Moreover, given shifting costs, technologies and attitudes, these assessments are likely to evolve over time and will necessitate ongoing review and revision.

Surface Water Diversions

Appropriate Measurement: State and federal water planners need accurate information to assist water planning and improve water balance estimates; the State needs accurate information to determine if basins are over-allocated and to adjudicate water rights disputes. This necessitates measurement of major surface water diversions using flow-

[1] The Technical Team consists of Authority staff and consultants with expertise in hydrology, irrigation technologies, economics, water law and facilitation.
[2] The Panel is a cross-disciplinary mix of six nationally recognized experts in measurement technology/hardware, economics, groundwater, water policy, district operations, and irrigation engineering.

totaling devices, data loggers and telemetry. Data needs to be managed locally and reported to the State.

Expected Impact: Impact to water users will be minimal since over 80% of major surface water diversions are already using such devices. Local agencies and the State will have expanded data management requirements. Where upgrades are needed, costs on an annual basis are expected to range between $10,000 and $15,000 per diversion point.

Groundwater Use

Appropriate Measurement: State and federal water managers need accurate information to characterize net groundwater use, help identify sustainable yield and support conjunctive use. This requires continuous regional characterization of groundwater using a detailed sub-basin hydrologic balance and water table methods. Data needs to be managed locally and reported to the State.

Expected Impact: Expected impacts to water users are likely to be minimal. The proposed method of continuous regional characterizations will mean higher state planning costs: roughly $2 million per year, or about $0.25 per irrigated acre annually.

Measurement Needs Contingent on Other Policy Changes: If the state opts to aggressively allocate groundwater resources, more accurate information would be needed. This would require totalizing flow meters or pump testing coupled with time of use to determine gross water pumped. Since the State does not currently allocate groundwater, there is no impact at this time. However, if the state were to implement such an approach, the impact would be significant because less than one-third of groundwater use is currently measured this way. Annual costs would range from $500 to $1,000 per wellhead or $20 million to $25 million statewide.

Crop Consumption

Appropriate Measurement: State and federal water managers need direct and more accurate measurement of crop consumption, which represents approximately 65% of consumptive water use in California. This is needed to calculate more accurate water balances that can better inform supply and demand projections and state/federal resource allocations. This requires use of satellite-generated remote-sensing, with a monthly time-step, during the growing season. Data needs to be housed in a state repository.

Expected Impact: This measurement approach is not expected to have a direct impact on water users. It does, however, represent a major change in how crop consumption is measured in California. Annual cost of measurement, beyond current state outlays, would be roughly $500,000 and would likely be borne by state and federal water agencies.

Return Flow, Water Quality and Stream Gauging

Appropriate Measurement: Not yet possible to define.

Actions Required to Develop Definition of Appropriate Measurement: Measurement information is needed to accurately characterize the state's water system and to address location-specific objectives such as water quality, water availability or water transfers. Current requirements for these locations are driven by place- or constituent-specific needs. However, there is not enough information at this time – either about measurement points currently in place or needed in the future – to articulate credible statewide measurement

requirements. The State should undertake a comprehensive review to better determine its needs for baseline information. There is no expected direct impact to water users at this time, as the state would be responsible for this comprehensive review.

Farm-Gate Deliveries

Appropriate Measurement: Existing farm-gate measurement hardware[3] is sufficient to support the state's current policies and objectives. However, state and federal water managers need aggregate estimates of farm-gate deliveries to assist statewide planning and improve water balance estimates. Therefore, farm-gate delivery data, whether currently estimated or directly measured, needs to be collected, managed locally and reported to the State.

Expected Impact: Requiring farm-gate delivery data does not represent an upgrade of farm-gate hardware for the majority of suppliers, but it does imply an increase in data collection and reporting activities for some water suppliers. Water suppliers not currently collecting this information may need to add a half- to full-time staff position for data management.

Measurement Needs Contingent on Other Policy Changes: If the State were to mandate volumetric water pricing, then all farm-gate deliveries would have to be measured at higher accuracy levels (either measuring flow with rated structures or using flow-totaling devices; estimates would not be sufficient). Data would need to be managed locally and reported to the State. Because the State does not currently mandate volumetric water pricing, there is no expected impact at this time. However, if the state were to pursue such a policy, the impact would be significant. The estimated annual cost for converting affected turnouts to more frequent and accurate measurements would range from $20 to $30 million statewide or $25 to $35 per affected acre.

Next Steps

The accompanying materials and draft conclusions are to be discussed by the Panel during its final set of deliberations, scheduled for June 9, 2003. Following the Panel's deliberations, a summary report will be drafted and disseminated to and discussed with CALFED decision-making bodies, stakeholders and the public.

Following these discussions, the Authority intends to convene a diverse stakeholder group to consider the Panel's definition of "appropriate measurement" and assist the Authority in developing an implementation strategy capable of being broadly supported by the many affected stakeholder communities. Any such approach would be consistent with CALFED's Solution Principles, including the concept of beneficiary pays. Finally, the Authority staff will work with state policymakers to develop the necessary package of legislative, regulatory and/or budgetary actions.

[3] Those already tracking farm-gate deliveries at higher accuracy levels (frequently and accurately measuring flow or using flow-totaling devices) are at the appropriate level. For the small percentage of water suppliers estimating deliveries, the analysis suggests it is neither cost-effective nor essential that they shift to a more aggressive measurement strategy.